Job Risk Assessment

Document Control No.: ***RA-08-1***	**Date Assessment Completed:** 6/30/2010	**Location:** Yerington Mine Site
Job Name: **Process Areas Radiological Materials Removal Action Plan** **PRELIMINARY (pre-contractor selection)**	**Job Description:** Excavation of select areas to depth of 2 or 3 ft to remove radiologically contaminated soil; temporary stockpile and blending of soil; loading and shipment of soil for offsite disposal at an approved landfill.	**Risk Assessment Leader:** Penny Bassett **Risk Assessment Team:** Jack Oman **SIMOPS:** ☑ Yes ☐ No **Designated PIC:** Roe Souther

Work Plan (List Job Steps) List the jobs required to complete the project scope in the sequence they are carried out.	Any tools or heavy equipment needed? If YES, What Type	Is this a SIMOP? If YES, Include in Mitigation Plan.	Do any of the *Golden Rules of Safety* apply? If YES, Which of the 8?	Which of the 8 energy or biological root sources could possibly be involved in this job?	**What** would be the result of exposure to a biological or energy source? (e.g., Bites, Slips, trips, falls, exposures, electrocution, injury, death, etc.); and **How, where, or when** could an uncontrolled release or unwanted contact with a biological or energy source occur? **Note:** Humans are biological sources, and their physical abilities, competency, and training should also be considered here.	Environmental Impacts Could there be a release to the air, soil or water, and or, will a waste be generated? If YES, What?	Pre-Mitigation Risk Evaluation: Frequency	Consequence	Likelihood	Risk Score	Permit(s) Required? If YES, What kind?	Energy / Biological / Waste Management Plan List control measures required to eliminate, control, or protect against unwanted contact with an uncontrolled biological or energy source to minimize the risk of injury or environmental Impact. **Hierarchy of Controls:** Elimination, Substitution, Isolation, Engineering/ Administrative, PPE	Who is responsible for Hazard Mitigation? Name or Title	Post-Mitigation Risk Evaluation: Frequency	Consequence	Likelihood	Risk Score
General Hazard: Biological - Stinging insects - Scorpions, snakes - Other wildlife			**No**	Biological	**Insects:** Insect stings can cause allergic reaction, even in those not previously known to be allergic. Can cause respiratory distress, itching, pain, rash. **Scorpions/snakes:** Scorpion sting is a lot like a wasp sting, very painful; can be very hard to see until you are right on them; tend to be most active a dawn & dusk.	**No**	Unusual Exposure	Serious Consequence	Unusual but possible	Low Risk	**No**	**Insects:** Identify workers with special sensitivities and be prepared with emergency treatment; keep Sting-Ez at job site to provide relief from pain and rash; monitor worker for worsening reaction for ~2 hrs. **Scorpions/snakes:** Inspect work area before setting up; rattle nearby bushes with stick.	All	Unusual Exposure	Important Consequence	Conceivable but unlikely	Minimal Risk
General Hazard: Driving - Mine site roads - Public roads in town (low speeds) - Public highways (high speeds)			**Yes** Driving Safety	Motion Biological	**Mine roads:** Areas with steep embankments; potential heavy equipment on roads; loss of traction if driving too fast; rock chips on windshield. **Town roads:** Low speed collision with other drivers or pedestrians; drunk drivers. **Highways:** High speed collision or loss of control with v. serious consequence; drunk, reckless, or distracted drivers.	**No**	Frequent Exposure	Very Serious Consequence	Unusual but possible	High Risk	**No**	***All Driving: No use of cell phone or other distractions while vehicle is moving.** **Mine roads:** Observe mine speed limit of 25 mph; be aware of other activity on site. **Town roads:** Observe posted speed limit; be aware of pedestrians and other drivers. **Highways:** Observe posted speed limit; avoid passing on 2-lane hwys if possible; drive with daytime headlights to be more visible.	All	Frequent Exposure	Serious Consequence	Remotely possible	Low Risk
General Hazard: Weather - Heat stress (hot summer weather) - High wind conditions & dust storms - Rain & electrical storms			**No**	Thermal Motion Electrical	**Heat stress:** Thermal hazard in summer months, workers can become dehydrated, disoriented, less aware of hazards if overheated. **Wind:** Wind speeds of 20-40 mph are not uncommon, can blow loose items to strike workers, dust can cause limited visibility or irritants in the eyes. **Rain/electrical storm:** Lightning strike to person or equipment could cause burn or electrocution; rain can make walking surfaces slippery and contribute to cold stress.	**No**	Occasional Exposure	Very Serious Consequence	Unusual but possible	Substantial Risk	**No**	**Heat Stress:** Maintain enough water at the work site to keep workers hydrated; provide shade when possible; monitor worker condition for signs of heat stress. **Wind:** Tie down or contain loose items on windy days; shut down operations if winds become severe. **Rain/electrical storm:** Use common sense if lightning storm occurs, STOP WORK if situation warrants but not mandatory for all visual occurance of lightning as would be for working around raised mast of drill rig; be aware of slippery surfaces and put down materials to create traction if possible.	All	Occasional Exposure	Important Consequence	Remotely possible	Minimal Risk
General Hazard: Radiological - Low level gamma and alpha radiation in excavated soil - Only one area is a designated radiological control area (RCA), others are below RCA limit			**No**	Radiation	**Gamma exposure:** Frequent or longterm exposure to radiation can cause illness, cancer. **Inhalation:** Inhalation of dust particles that contain alpha radiation can lodge in lungs and cause lung cancer. **Equipment contamination:** Equipment may become contaminated with radiological materials which could be spread to other areas or offsite.	**No**	Frequent Exposure	Very Serious Consequence	Unusual but possible	High Risk	**No**	**Gamma exposure:** Workers should wear radiation dosimeters during the course of work to monitor dosage received. **Inhalation:** A combination of personal and area air monitoring and/or respirators should be used to monitor/limit inhalation exposure; workers should be fit tested and determined to medically capable of wearing respirator before being issued. **Equipment contamination:** All large and small equipment should be deconned on-site and should be scanned by radiation survey meter before release from the site.	All	Occasional Exposure	Important Consequence	Remotely possible	Minimal Risk
Survey and mark out planned excavation areas and conduct preliminary utility survey and hand auger and/or air knife. - GPS survey and place markers to demark excavation boundary - Electomagnetic and/or GPR survey to identify possible buried utilities or pipelines - Hand auger or air knife several location in excavation where utilities may be present to 3 ft depth.	Air knife rig?	**No**	Ground Disturbance	Motion Gravity Radiation Thermal	**Motion** - Walking on uneven ground surface, trip hazard; muscle/back strain from twisting motion of hand auger; movement of air knife rig could strike person or other obstruction in tight areas. **Gravity** - working around areas with unprotected fall hazards (open basements, steep slopes, trenches) workers could fall in. **Radiation** - Workers could be exposed to radiation in the dirt/dust during hand auger/air knife. **Thermal** - Heat stress from high physical exertion during summer weather. **Pressure** - High pressure air and noise if air knife used, iar or debris could strike workers	**No**	Occasional Exposure	Very Serious Consequence	Unusual but possible	Substantial Risk	**Yes** Ground Disturbance	**Motion** - Pay close attention to trip hazards and select appropriate pathways to avoid hazardous areas; trade off owrkers during hand auger to minimize fatigue; use spotter if driving air knife to locations. **Gravity** - Remain at least 3 feet from open unprotected basements or if must work near then place protective cones and ribbon to visually identify the edge. **Radiation** - Wear dosimeters during hand clearance activity. (Refer to general radiation mitigation.) **Thermal** - monitor for heat stress, stay hydrated, limit heavy exertion to cooler times of day, take frequent rest breaks in cool shady area. **Pressure** - Do not point air wand at any person or body part; Do not put hands or body parts near vacuum hose intake; wear face shield and hearing protection.	Surveyor, field technician/sampler	Occasional Exposure	Very Serious Consequence	Unusual but possible	Substantial Risk
Mobilize equipment to site and unload.	**Yes** Backhoe Flatbed truck	**No**	Driving Safety	Motion Gravity	**Motion** - During loading/unloading of equipment, operator could be struck by or caught between equipment and transport truck or ground. Hand injury and pinch points when handling tie-down chains. Transport of equipment on highway could be subject to vehicle collision or loss of control. **Gravity** - Operator could fall from flatbed truck or equipment.	**No**	Occasional Exposure	Serious Consequence	Unusual but possible	Low Risk	**No**	**Motion:** Use spotter as needed when loading/unloading from transport trailer; select unloading area free of obstructions or other hazards; wear gloves when tightening/loosening tie-down chains. **Gravity:** Use 3-pt contact when getting on/off equipment or trailer; pay attention to footing and tripping hazards.	Equipment operator	Occasional Exposure	Important Consequence	Remotely possible	Minimal Risk
Prepare temporary stockpile location (Surge Pond) - Geotechnical testing to determine equipment restrictions. - Excavate part of berm of surge pond and/or construct ramp to allow truck access - Road improvements (grading, widening, straightening)	**Yes** Loader or dozer	**No**	Ground Disturbance	Motion Radiation Pressure	**Motion** - Movement of heavy equipment could strike worker, equipment, utilties; getting on/off equipment potential for fall or sprain; **Radiation** - Potential to stir up dust in radiation contamination area. **Pressure** - Tracked equipment is very noisy, potential for hearing loss	**Yes** Generation of radiation dust	Occasional Exposure	Very Serious Consequence	Unusual but possible	Substantial Risk	**Yes** Ground Disturbance	**Motion** - Ground workers to stay clear of moving equipment, get full visual contact with operator before approaching and ensure vehicle is not in motion; use 3-point contact when getting on/off equipment. **Radiation** - Use dust mitigation measures (wetting surface) and air monitors. Select equipment with closed cab and air filtration system or respirators may be required. (Refer to general radiation mitigation.) **Pressure** - Wear hearing protection as needed	Equipment operator	Occasional Exposure	Very Serious Consequence	Unusual but possible	Substantial Risk
Excavate designated areas and haul to temporary stockpile - Use trackhoe excavator to dig to 2 or 3 ft bgs as required by work plan - Load to small end-dump truck - Drive truck to stockpile and dump	**Yes** Trackhoe, dump truck, water truck	**Yes**	Ground Disturbance	Motion Gravity Radiation Chemical Pressure	**Motion/gravity** - Movement of heavy equipment could strike ground workers; some location have limited access may require backing long distance and in areas with multiple obstacles; falling hazard from working near open excavation (only 2-3 ft deep); getting on/off equipment; surface obstructions (debris) may need to be moved. **Radiation** - Potential to stir up dust in radiation contamination area. **Chemical** - Potential to strike unidentified underground utilities or pipelines. There are no live electrical or gas lines in work area, but old pipelines may contain remnant chemicals or asbestos. **Pressure** - Hearing loss from noise of equipment.	**Yes** Generation of radiation dust	Continuous Exposure	Very Serious Consequence	Unusual but possible	Very High Risk	**Yes** Ground Disturbance	**Motion/gravity** - Ground workers to stay clear of moving equipment, get full visual contact with operator before approaching and ensure vehicle is not in motion; use 3-point contact when getting on/off equipment. If it is necessary to enter a trench for examination, construct a sloped access point and enter only if the excavation is wide enough so there is no potential for trench wall collapse. **Radiation** - Use dust control and monitoring measures. (Refer to general radiation mitigation.) **Chemical** - Use a spotter to watch the excavation for indications of potential pipelines encountered **Pressure** - Hearing protection as needed.	Equipment operator	Frequent Exposure	Very Serious Consequence	Remotely possible	Substantial Risk

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Load stockpile to lined highway transport trucks & transport to landfill - Front end loader to load trucks - Place cover over waste in truck bed - Drive to landfill and dump load (~8-10 hr one-way)	**Yes** Loader, transport trucks, water truck	**Yes**	**Yes** Driving Safety	Motion Gravity Biological Radiation	**Motion** - Highway driving hazards, potential for high speed collision or loss of control; motion of loader while loading trucks could strike workers on ground; backing trucks to loading area. **Gravity** - Potential falling hazard while securing and checking tarp cover over truck bed. **Biological** - Fatigue from long distance driving; distractions while driving. **Radiation** - Potiential exposure to radiologically contaminated soils.	**Yes** Spilled load of regulated waste on public highway	Continuous Exposure	Very Serious Consequence	Unusual but possible	**Very High Risk**	**No**	**Motion** - Driver should remain in their truck while being loaded; follow posted highway speed limits or slower depending on weather or other conditions; drivers should have received driver safety training and have CDL liscence. **Gravity** - Do not climb truck exterior unless there are appropriate walkways or steps. **Biological** - Drivers should have "fatigue management" training; limit driving hours to no more than 10 hrs per day with sufficient rest breaks; do not use cell phone while vehicle is in motion, limit other in-cab distractions such as eating or adjusting audio device during movement. **Radiation** - Refer to general radiation mitigation.	Truck driver	Frequent Exposure	Serious Consequence	Remotely possible	**Low Risk**
Backfill or place protective berms or barriers around open excavations - Place berm around pit; or - Cut and smooth pit edge to be a graded slope; or - Place cones, barricades, warning signs, ribbon around open excavation	**Yes** Loader, dump truck	**No**	**Yes** Ground Disturbance	Motion Gravity Radiation	**Motion/gravity** - Movement of heavy equipment could strike ground workers; some location have limited access may require backing long distance and in areas with multiple obstacles; falling hazard from working near open excavation (only 2-3 ft deep); getting on/off equipment; surface obstructions (debris) may need to be moved. Potential to encounter underground utilities or abandoned pipelines if pit edges are cut and sloped. **Radiation -** Potiential exposure to radiologically contaminated soils.	**No**	Occasional Exposure	Very Serious Consequence	Unusual but possible	**Substantial Risk**	**Yes** Ground Disturbance GD if cut and sloping is done	**Motion/gravity** - Ground workers to stay clear of moving equipment, get full visual contact with operator before approaching and ensure vehicle is not in motion; use 3-point contact when getting on/off equipment. Use spotter to guide backing vehicle, stay out of way when dumping. Follow GD permit procedures. **Radiation -** Refer to general radiation mitigation.	Equipment operator	Occasional Exposure	Very Serious Consequence	Unusual but possible	**Substantial Risk**
Decon and complete a radiation survey on equipment	**Yes** Pressure washer	**No**	**No**	Pressure Chemical Motion Radiation	**Pressure** - High pressure water can cause injury if directed at a person; water and debris can splash back at the operator and get in face/eyes. **Chemical** - Rinse water may contain chemicals or radioactive material and shoul be prevented from running off the site. **Motion** - Driving equipment to decon area; walking on/around equipment to conduct rad survey. **Radiation** - Potiential exposure to radiologically contaminated soils.	**Yes** Rinse water runoff	Unusual Exposure	Serious Consequence	Unusual but possible	**Low Risk**	**No**	**Pressure** - Certify that operator is trained/qualified to operate pressure washer; never direct wand at another person; wear safety glasses and face shield. **Chemical** - Decon in designated area so that runoff water is contained on site. **Motion** - Do not climb on equipment. **Radiaition** - Refer to general radiation mitigation.	Equipment operator	Unusual Exposure	Serious Consequence	Remotely possible	**Minimal Risk**